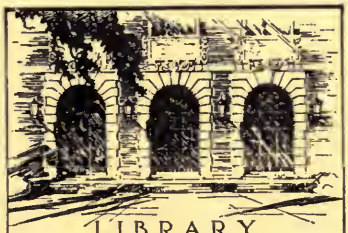
SHOUT
SHARE
IT



LIBRARY
OF THE
UNIVERSITY
OF ILLINOIS

580.5
FB
v. 20
no. 1-7

JUN 18 1959

BIOLOGY.

FB
.204

TROPICAL MARINE ALGAE OF THE ARTHUR SCHOTT HERBARIUM

BY

WILLIAM RANDOLPH TAYLOR

PROFESSOR OF BOTANY, UNIVERSITY OF MICHIGAN

THE LIBRARY OF THE
DEC 18 1941
UNIVERSITY OF ILLINOIS

BOTANICAL SERIES
FIELD MUSEUM OF NATURAL HISTORY
VOLUME 20, NUMBER 4
NOVEMBER 29, 1941

PUBLICATION 509

TROPICAL MARINE ALGAE OF THE ARTHUR SCHOTT HERBARIUM

BY

WILLIAM RANDOLPH TAYLOR

PROFESSOR OF BOTANY, UNIVERSITY OF MICHIGAN

THE LIBRARY OF THE
DEC 18 1941
UNIVERSITY OF ILLINOIS

BOTANICAL SERIES
FIELD MUSEUM OF NATURAL HISTORY
VOLUME 20, NUMBER 4
NOVEMBER 29, 1941

PUBLICATION 509

PRINTED IN THE UNITED STATES OF AMERICA
BY FIELD MUSEUM PRESS

580.5
FB
v.20[4]

TROPICAL MARINE ALGAE OF THE ARTHUR SCHOTT HERBARIUM

WILLIAM RANDOLPH TAYLOR

It has been a peculiar pleasure to the writer to receive for study from time to time small groups of algal specimens collected by noted travellers primarily searching for land plants. These collections, sadly neglected since first brought back to our botanical institutions, if reported upon early would have added greatly to our knowledge of the marine algae of seas still barely touched; only now can the records they afford be published. The collection here in part reviewed is one of this sort, and one of the largest. Even at this late date many new records, and some actual extensions of range, are afforded by its study.

Arthur Carl Victor Schott (1814–1875) seems to have been an accomplished surveyor and naturalist (Sargent 1896, p. 18; Geiser 1936, p. 52; 1937, p. 332). During the survey of the Mexican–United States Boundary he had charge of one of the field parties, and at the same time looked after a good deal of the botanical, zoological, and especially the geological collecting, for the Boundary Survey combined scientific exploration with its exacting professional demands on the surveyors. Apparently this was not Schott's only other accomplishment, for one notes in addition to references to his plants collected, that a number of topographic sketches and the colored prints of American Indian types published in the reports of the Survey are taken from his water-color sketches. The writer has no access to any biography or journals of Schott, so cannot attempt a résumé of his activities. By inspection of his specimens it appears that Schott collected in January and February 1853 at Indianola, Texas. On the 6th of the same month he also collected at Galveston, and during October, November, and December of that year, at the mouth of the Rio Grande (Boca del Rio Bravo del Norte of his old terminology). Again on the first of February 1854, and in 1855, he came to Indianola, securing an occasional specimen.

So far as they concern us, Schott next collected marine algae at Cartagena (approximately 10° 25′ N. L.) in Colombia (politically Nueva Granada at that period), on the 5th and 8th of November 1857. Here he was again concerned with an engineering project, the interocean canal across Darien, but secured many algal speci-

1894 dis 24 v.20[4], 1941 cont

mens. Early in November 1864, the 5th to 7th, he was in Havana, Cuba, and secured a number of specimens. Immediately thereafter he seems to have gone to Yucatan, for we have dates of the 15th November 1864 and December 1864 for Sisal. It appears (Standley 1930, p. 167) that he had been engaged by the Mexican government to make a geological survey of the peninsula. His botanical collections, particularly of vascular plants, were very extensive during this period. Early next year he did more work there between the 3rd and 13th of May. Specimens were collected on the 12th and 13th of May 1865 at Celestum also, overlapping the dates for Sisal, but the algal specimens attributed to Celestum for these dates are the more numerous. Celestum and Progreso are about 25 miles apart, air-line measure, and slightly farther by sea; Sisal (about 21° N. L.) is somewhat nearer Progreso, but like the others on a long sandy island which lies off that part of the Mexican coast, separated by a narrow channel, the Rio Grande de Lagartos, from the mainland. Off shore lies the great Campeche Bank, whence algal specimens were secured by Liebmann and described as new by J. G. Agardh (1847).

There are a few specimens cited in this paper from the above stations with other dates; possibly these are quite correctly labelled, but one feels a little hesitancy about accepting them, for fear some error has been made. Schott's specimens were numbered at some time after the labels were originally written, and there seems to be no logical sequence in relation to places or dates, which would have helped to confirm the data. The herbarium accession numbers, also, falling into more than one series, bear no relation to the others. It is not certain that all algal items collected by Schott at these places have come before the writer; in an earlier paper he (Taylor 1935, p. 124) published on six Schott algae in the collections of the British Museum (Natural History) some of which had numbers not represented in the Field Museum material; how many more were dispersed in the collections the writer cannot say.

It seems that Schott had hoped to have his collections worked up and published, but he died with this undone. It appears that he sent a set of specimens to W. H. Harvey at Dublin; just how wide a selection is not clear. At any rate a number of specimens of Schott's collecting on the Californian coast are cited in the "Nereis" (Harvey 1852–58), and Harvey returned a list of algae (chiefly from Cartagena) which Schott, with an introduction of his own, published in Lieut. Michler's report of the Darien survey (Harvey and Schott 1861). This small list did not cover all of the

Cartagena specimens, and he probably had far from a full series available. Other determinations on Schott's original labels may also derive from his correspondence with Harvey.

A letter written by C. F. Millspaugh at the time of the sale of Schott's specimens mentions a set sent to the Smithsonian Institution and another sent to Kew Herbarium, but not those at the British Museum. It appears that Schott intended to keep intact a complete set of algae for his own collections, and only sent off duplicates of those things of which he had an abundance. For a very modest sum Schott's widow sold his collections to Field Museum of Natural History in March 1897; they were large, of some thousands of specimens, not primarily algae. The algae were sent to W. G. Farlow of Cambridge for identification, and in Nov. 1898 he sent all of the specimens and the identifications back to Field Museum, but did not publish them. Apparently Farlow did not receive any of the material for his own herbarium. With these unpublished determinations the writer must in part disagree, and would at least have to modernize the nomenclature, so they are not cited. The published records in Harvey's list (Harvey and Schott 1861) are, however, incorporated. A number of additional specimens from these stations, for which no satisfactory determinations could be offered, exist in the collections of Field Museum.

The writer is greatly indebted to Major C. C. Gregg, Director of Field Museum of Natural History, and to Dr. Francis Drouet, Curator of Cryptogamic Botany, for the opportunity of studying this material and reporting upon it. Incorporated in this paper are a few records of specimens from other collections, but all of the specimens cited are in the Cryptogamic Herbarium of the Field Museum, and the italic number appended to each specimen record is the sheet number in that herbarium. For correspondence and information regarding the Schott specimens and other assistance the writer is indebted to Dr. Drouet, to Dr. W. R. Maxon of the U. S. National Herbarium, to Dr. D. H. Linder of the Farlow Herbarium, to Prof. S. W. Geiser of Southern Methodist University, Dr. C. L. Lundell of the University of Michigan Herbarium.

CHLOROPHYCEAE

Ulvaceae

ENTEROMORPHA LINGULATA J. Ag.—TEXAS: Indianola, Schott 17a, Jan. 1853, *980659;* 9, 9a, 17b, Feb. 7, 1853, *980658, 979680, 979016;* mouth of the Rio Bravo del Norte, Schott 18, no date,

38431, Schott 10, Oct. 1853, *38432*, Schott 192, on sea beach, 1853, *980531*.

ULVA LACTUCA L.—TEXAS: Indianola, Schott 8, Feb. 1, 1853, *67099;* Schott no number, 1855, *670100;* Galveston, no collector given, no. 1, May 1878, *797077*, *797078;* CUBA, Habana, Schott 211, Nov. 6, 1864, *670092*.

ULVA LACTUCA var. LATISSIMA (L.) DC.—COLOMBIA: Cartagena, Schott 52, Nov. 1857, *670096*.

Valoniaceae

CHAMAEDORIS PENICULUM (Ell. & Soland.) Kuntze.—COLOMBIA: Cartagena, Schott 11, Nov. 1857, *38435*.

CLADOPHOROPSIS MEMBRANACEA (C. Ag.) Børg.—YUCATAN: Sisal, Schott 790, May 9, 1865, *977611*.

Cladophoraceae

CHAETOMORPHA MEDIA (C. Ag.) Kütz.—VENEZUELA: Puerto Cabello, Fr. Santiago 83, no date, *1007647*.

RHIZOCLONIUM KOCHIANUM Kütz.?—TRINIDAD, B. W. I.: Cedros, on the ground close to the sea, W. E. Broadway 7018, Jan. 15, 1908, *676312*.

CLADOPHORA FASCICULARIS (Mert.) Kütz.—COLOMBIA: Cartagena, Schott 16, 22, Nov. 1857, *977644*, *980649;* YUCATAN: Sisal, 370, 789a, May 9, 1865, *980724*, *979502*.

Dasycladaceae

ACETABULARIA CRENULATA Lamx.—COLOMBIA: Puerto Colombia, attached to rocks near the water's edge, Fr. Elias 1402, Jan. 1937, *822424*.

Bryopsidaceae

BRYOPSIS PLUMOSA (Huds.) C. Ag.—YUCATAN: Sisal, Schott 371a, May 9, 1865, *977608;* Schott 373 (Taylor 1935, p. 124).

Caulerpaceae

CAULERPA ASHMEADII Harv.—YUCATAN: Sisal, Schott 209, May 9, 1865, *978988* (Taylor 1935, p. 124).

CAULERPA CRASSIFOLIA (C. Ag.) J. Ag. var. MEXICANA (Sond.) Weber-van Bosse.—YUCATAN: Sisal, Schott 368, no date, *980522* (Taylor 1935, p. 124).

CAULERPA CUPRESSOIDES (Vahl) C. Ag.—YUCATAN: Chichankanab, G. F. Gaumer 1382, no date, *980529*.

CAULERPA CUPRESSOIDES var. MAMILLOSA (Mont.) Weber-van Bosse f. NUDA Weber-van Bosse.—YUCATAN: Sisal, Schott 277b, May 9, 1865, *980520*.

CAULERPA CUPRESSOIDES var. TURNERI Weber-van Bosse.—YUCATAN: Progreso, Schott 277a, Apr. 5, 1865, *980594;* Sisal, Schott 277, May 9, 1865, *979684*.

CAULERPA PASPALOIDES (Bory) Grev. var. WURDEMANNII Weber-van Bosse.—YUCATAN: Progreso, Schott 345a, Apr. 5, 1865, *40209;* Sisal, Schott 345, May 9, 1865, *980750*.

CAULERPA PROLIFERA (Forssk.) Lamx.—YUCATAN: Progreso, Schott 334, Apr. 1865 (Taylor 1935, p. 124); Sisal, Schott 344a, May 1865, *980521*. Superbly developed plants, probably from shallow water, with blades to 1.5 cm. wide by 11.0 cm. long when dried.

CAULERPA RACEMOSA (Forssk.) J. Ag.—COLOMBIA: Cartagena, in shallow water, Schott 20, Nov. 1857, *979012* (Harvey and Schott 1861, p. 177, as *C. clavifera*); CUBA: Habana, Schott 213, Nov. 6, 1864, *967705*.

CAULERPA SERTULARIOIDES (Gmel.) Howe f. BREVIPES (J. Ag.) Svedel.—COLOMBIA: Cartagena, Schott 27b, Nov. 8, 1857, *978999* (Harvey and Schott 1861, p. 177, as *C. plumaris* in part).

CAULERPA SERTULARIOIDES f. LONGIPES (C. Ag.) Coll.—COLOMBIA: Cartagena, Schott 27, Nov. 1857, *972767* (Harvey and Schott 1861, p. 177, as *C. plumaris* in part).

CAULERPA TAXIFOLIA (Vahl) C. Ag.—COLOMBIA: Puerto Colombia, Fr. Elias 1526, Jan. 1937, *881191;* "Region of Barranquilla," Fr. Elias 1529, no date, *881176*.

Codiaceae

CODIUM ISTHMOCLADUM Vick.—YUCATAN: Sisal, A. Diaz (Schott 210), Dec. 1864, *670091;* Celestum, Schott 374, May 12, 1865, *979504;* COLOMBIA: Cartagena, Schott 36, Nov. 8, 1857, *979011* (Harvey and Schott 1861, p. 178 as *C. tomentosum*); Puerto Colombia, Fr. Elias 1400, Jan. 1936, *822413* (?).

HALIMEDA TRIDENS (Ell. & Soland.) Lamx.—YUCATAN: Sisal, Schott 786, no date, *977610*.

HALIMEDA TUNA (Ell. & Soland.) Lamx.—CUBA: Habana, Schott 945a, 1864, *979503;* YUCATAN: Sisal, Schott 785, Nov. 10, 1865, *967764;* Schott 786 (Taylor 1935, p. 124).

Near var. MINOR Vick.—CUBA: Habana, Schott 945, 1864, *979510.*

Near var. PLATYDISCA (Decne.) Bart.—COLOMBIA: Cartagena, Schott 94, Nov. 1857, *980518* (Harvey and Schott 1861, p. 178 as *H. Tuna*).

PENCILLUS LAMOUROUXII Decne.—YUCATAN: Sisal, Schott 784, Nov. 10, 1865, *40575.*

PHAEOPHYCEAE

Ectocarpaceae

ECTOCARPUS BREVIARTICULATUS J. Ag.—COLOMBIA: Cartagena, Schott 28, Nov. 5, 1857, *41192* (Harvey and Schott 1861, p. 177, referred to under the specific designation "octosporus"; Børgesen 1914, p. 173).

Dictyotaceae

DICTYOPTERIS DELICATULA Lamx.—COLOMBIA: Cartagena, Schott 91a in part, Nov. 1857, *982222;* CUBA: Habana, Schott 227 in part, Nov. 5, 1864, *670114;* YUCATAN: Sisal, Schott 791, Dec. 1864, *40584;* Schott 456a in part, May 7, 1865, *980596;* PANAMA CANAL ZONE: Cristobal, Mrs. Geo. Artamanoff, no number, in part, Feb. 8, 1939, *968547.*

DICTYOTA CERVICORNIS Kütz.—COLOMBIA: Cartagena, Schott 20, Nov. 1858, *979013;* YUCATAN: Sisal, Schott 365, May 8, 1865, *980523* (perhaps Harvey and Schott 1861, p. 176 as *D. dichotoma* belongs here).

DICTYOTA CILIOLATA Kütz.—YUCATAN: Progreso, Schott 347, Apr. 5, 1865, *980499;* Sisal, Schott 365 (Taylor 1935, p. 124).

DICTYOTA DIVARICATA Lamx.—COLOMBIA: Cartagena, Schott, no number, 1857, *980656.*

PADINA SANCTAE-CRUCIS Børg.—COLOMBIA: Schott 26, Nov. 9, 1857, *979007;* YUCATAN: Sisal, Schott 366, May 7, 1865, *977606.*

PADINA VICKERSIAE Hoyt.—YUCATAN: Progreso, Schott 366b, Apr. 5, 1865, *980733.*

ZONARIA VARIEGATA (Lamx.) Mert.—COLOMBIA: Cartagena, Schott 6, Nov. 1865, *114255* (Harvey and Schott 1861, p. 176 as *Z. lobata*).

Fucaceae

SARGASSUM FILIPENDULA C. Ag.—TEXAS: Boca Chica del Rio Bravo del Norte, Schott 34, no date, *41378;* CUBA: Habana, Schott 228, Nov. 1864, *670103;* YUCATAN: Sisal, Schott 367, May 8, 1865, *978990;* Chichankanab, G. F. Gaumer 1387, no date, *57316, 438292, 979541;* Silam, Gaumer 2371, no date, *125940.*

SARGASSUM HYSTRIX J. Ag. var. SPINULOSA (Kütz.) Grun. Plate I, figs. 1–3. Plant to 40 cm. tall, bushy, several slender stems eventually arising from the common (or conjoined?) holdfast. Stems freely alternately branched, the branches similar to the main axis, smooth throughout. Leaves scattered on the stems and branches, obtuse-oblong, below to 2.5 cm. long, 1.3 cm. wide, the base cuneate, the apex broadly rounded; midrib not conspicuous, nearly obsolete in the upper third of the leaf; margin crisped, irregularly and shallowly dentate, teeth aculeate tipped; cryptostomata numerous, very small, about 0.10–0.15 mm. diam., scattered over the leaf; leaves in the upper parts of the plant smaller, relatively broader, as 1.0 cm. long by 0.7 cm. wide, the cuneate base more prominent; further reduced at the bases of the receptacles. Vesicles scattered on the plant, solitary in the leaf axils or at the bases of branchlets or receptacles, 3–5 mm. diam., not apiculate, pedicel short, generally about 0.33–0.50 diam. of the vesicle in length, slender, not alate. Receptacles axillary to foliar bracts, 0.5–1.0 cm. long, one or two times alternately divided, or the bracts suppressed with the apparent result of an inflorescence 3–6 times alternately branched on its main axis, the chief divisions in turn once or twice further divided; ultimate segments nodulose, subcylindrical below, cervicorn to plane above with coarsely aculeate margin, fertile throughout.—GRENADA, B. W. I.: St. Georges Harbor, floating, B. E. Dahlgren, without number, Feb. 22, 1922; BRAZIL: Urubú, Municipio de Fortaleza, Ceará, washed up on the beach, Drouet 1331a, July 27, 1935 (perhaps also Rio de Janeiro, Hassler Exped. 1084, earlier thought to be a form of *S. Filipendula*).

In addition to the Grenadine specimen, on which the description is based, the writer would assign to this variety one from Fortaleza in Brazil. This plant has closely similar conceptacles and vesicles, though the latter occasionally have slightly foliar margined pedicels and bladders; the leaves are relatively narrower in the basal parts of the plant, more coarsely aculeate-dentate, larger (to 15 mm. wide, 40 mm. long) and the midrib subpercurrent.

Furthermore, he has before him a specimen from the harbor of Rio de Janeiro which has similar leaves, perhaps even larger and more pronouncedly aculeate-dentate, certain identification being withheld because of the sterility of the specimens.

In our Caribbean flora among the certainly known Sargassa only *S. platycarpum* has flat receptacles, which are laterally moderately dentate; the leaves show a single row of exceptionally large cryptostomata on each side of the midrib. Of the same flora *S. Hystrix* has terete-compressed cylindrical to obconic receptacles which are dentate, but not as spectacularly so as the present plant. The leaves of the common Florida phase of this species show no cryptostomata, or reduced ones, and tend to be more nearly entire; it is recognized as the var. *buxifolium* (Chauv.) J. Ag. The writer has compared[1] his specimens with a photograph of a specimen of *S. Hystrix* in Herb. J. Agardh, no. 2463, from Campeche Bank, leg. Liebmann, and notes that this authentic specimen has leaves strongly tapered toward each end, and the receptacles much more crowded. However, Kützing (Tab. Phyc. 11: pl. 4611 as *Carpacanthus spinulosus*) had a plant from the West Indies very like the present, though the spines on the receptacles were more divaricate. Børgesen (1914, p. 221) doubted if this was specifically the same as *S. Hystrix*, though DeToni (1895, p. 53) so accepted it. For the present and until more material is available it seems best to accept Grunow's (1915, p. 399) rating as a variety, with the amplified description to emphasize its peculiarities.

SARGASSUM FLUITANS Børg.—TEXAS: Boca del Rio Bravo del Norte, on the sea beach, Schott 187 in part, Nov., Dec. 1853, *670115;* CUBA: Moriano, Habana, driven ashore by a storm, H. A. van Hermann 455, 1. 8. 1905, *183181;* PANAMA CANAL ZONE: Cristobal, Mrs. Geo. Artamanoff, no number, Feb. 8, 1939, *967412.*

SARGASSUM NATANS (L.) J. Meyen.—TEXAS: Boca del Rio Bravo del Norte, on the beach, Schott 189 in part, Nov., Dec. 1853, *670115;* GULF STREAM in the Atlantic: Schott 59, Oct. 1857, *670113;* CUBA: Habana, A. Marnitz (herb. Schott, no number), no date, *670105.*

SARGASSUM POLYCERATIUM Mont.—CUBA: Habana, Schott 227, Nov. 5, 1864, *670114;* PANAMA CANAL ZONE: Cristobal, Mrs. Geo. Artamanoff, Feb. 8, 1939, *968547.*

[1] The writer is greatly indebted to Dr. Eric Hultén, the Director of the Herbarium, University of Lund, and to Professor Harald Kylin, for the opportunity of examining the algae in the Agardhian Herbarium in 1937.

SARGASSUM VULGARE C. Ag.—COLOMBIA: Puerto Colombia, Fr. Elias 1528, Jan. 1937, *881165;* VENEZUELA: Macuto, D. F., along the beach, H. Pittier 13044, no date, *615258.*

TURBINARIA TURBINATA (L.) Kütz.—COLOMBIA: Cartagena, Schott 8, Nov. 1857, *114250* (Harvey and Schott 1861, p. 176).

RHODOPHYCEAE

Chaetangiaceae

GALAXAURA MARGINATA (Ell. & Soland.) Lamx.—CUBA: Habana, Schott 952, 1864, *980504.*

GALAXAURA OBLONGATA (Ell. & Soland.) Lamx.—CUBA: Habana, Schott 948, Nov. 6, 1864, *980537.*

GALAXAURA RUGOSA (Soland.) Lamx.—CUBA: Habana, Schott 948 in part, Nov. 6, 1864, *980537.*

Gelidiaceae

GELIDIUM PUSILLUM (Stackh.) LeJol.—COLOMBIA: Cartagena, on rocks near tide line, Schott 24, Nov. 6, 1857, *977646.*

Corallinaceae

CORALLINA CUBENSIS (Mont.) Kütz.—CUBA: Habana, Schott 227 in part, Nov. 5, 1864, *670114;* YUCATAN: Sisal, Schott 454 in part May 7, 1864, *977634;* Schott 424, May 1865, *982245;* Schott 367 in part, May 8, 1865, *978990;* Progreso, Schott 424a, Apr. 5, 1864, *982247;* Celestum, Schott 378a, in part, May 13, 1865, *982241.*

CORALLINA SUBULATA Ell. & Soland.—COLOMBIA: Cartagena, Schott 9b in part, 91, 91a in part, Nov. 1857, *980516, 982234, 982222;* CUBA: Habana, Schott, no number, Nov. 5, 1864, *98223;* YUCATAN: Sisal, Schott 424b, May 1865, *982235.*

JANIA CAPILLACEA Harv.—CUBA: Habana, Schott, no number, in part, Nov. 5, 1864, *982223.*

Grateloupiaceae

CRYPTONEMIA CRENULATA J. Ag.—COLOMBIA: Cartagena, Schott 83, Nov. 1857, *980816.*

CRYPTONEMIA LUXURIANS (Mert.) J. Ag.—COLOMBIA: Cartagena, on corals in the harbor, Schott, no number, Nov. 1857, *982236.*

HALYMENIA FLORESIA (Clem.) C. Ag.—COLOMBIA: Cartagena, Schott 7, Nov. 1857, *982244* (Harvey and Schott 1861, p. 177).

GRATELOUPIA CUNEIFOLIA J. Ag.—VENEZUELA: Puerto Cabello, Fr. Santiago 84, no date, *1007668*.

Solieriaceae

AGARDHIELLA TENERA (J. Ag.) Schmitz.—GULF OF MEXICO: Schott 198, 1853, *977594;* TEXAS: on the beach, Boca del Rio Bravo del Norte, Schott 190, Nov. 1853, *979282;* Indianola, Schott, no number, 1855, *982267;* COLOMBIA: Schott 82, Nov. 8, 1857, *980744;* YUCATAN: Sisal, Schott 444, May 9, 1865, *980535*.

Rhodophyllidaceae

EUCHEUMA ACANTHOCLADUM (Harv.) J. Ag.—GULF OF MEXICO: Schott 187 in part, 1853, *978975*.

EUCHEUMA ISIFORME (C. Ag.) J. Ag.—YUCATAN: Sisal, Schott 222a, Nov. 11, 1864, *978985;* A. Diaz, herb. Schott 221, 222, 223, Dec. 1864, *978976, 978980, 980743;* Schott 225 Dec. 1864, *978983;* Schott 441b, May 10, 1865, *978987;* Schott 441a, May 1865, *977589;* Schott 437, Nov. 9, 1865, *980539;* Schott 441, Nov. 10, 1865, *978989;* Progreso, Schott 439, Apr. 4. 1865, *979022;* Schott 279, 281, Apr. 5, 1865, *978984, 978986*.

WURDEMANNIA MINIATA (Draparn.) Feldm. & Hamel.—CUBA: Habana, Schott 231, Nov. 5, 1864, *977598*.

Hypneaceae

HYPNEA CERVICORNIS J. Ag.—COLOMBIA: Cartagena, Schott 38, 47 (Harvey and Schott 1861, p. 177, as *H. cornuta*), 74, Nov. 1857, *980730, 977642, 977631;* Schott 87, Nov. 8, 1857, *977592;* YUCATAN: Progreso, Schott 453, Apr. 5, 1865, *980533;* Sisal, Schott 454, May 7, 1865, *977634*.

HYPNEA MUSCIFORMIS (Wulf.) Lamx.—TEXAS: Indianola, Schott, no number, Feb. 1, 1854, *977640;* COLOMBIA: Cartagena, Schott, no number, no date, *980725;* Schott 14, Nov. 1857, *977593;* Schott 9b, 43, 88, all in lesser part, Nov. 1857, *980516, 980718, 980729;* Schott 87, in lesser part, Nov. 8, 1857; Puerto Colombia, Fr. Elias 1530, Jan. 1937, *881162;* CUBA: Habana, Schott 212, in lesser part, Nov. 7, 1864, *980527;* YUCATAN: Progreso, Schott 346a, Apr. 5, 1865, *980647;* Sisal, Schott 233, May 7, 1865, *977590;* Schott 373 in lesser part, May 9, 1865, *40257;* Schott 465a in lesser part, 465, May 13, 1865, *977615*.

HYPNEA SPINELLA (C. Ag.) Kütz.—COLOMBIA: Puerto Colombia, Fr. Elias, no. 1527, Jan. 1937, *881177*.

Gracilariaceae

GRACILARIA ARMATA J. Ag.—COLOMBIA: Cartagena, Schott 34 in part, Nov. 1857, *980735;* YUCATAN: Sisal, Schott 232, Nov. 15, 1864, *980728* (?); Schott 447b, May 9, 1865, *978982* (?); Progreso, the specimens somewhat more characteristic than those just mentioned, Schott 449, Apr. 3, 1865, *978977*. Some of the specimens which Harvey and Schott (1861, p. 177) assigned to *G. caudata* may belong here.

GRACILARIA CERVICORNIS (Turn.) J. Ag.—COLOMBIA: Cartagena, Schott 5, Nov. 8, 1857, *980506* (Harvey and Schott 1861, p. 177 as *G. domingensis*); YUCATAN: Sisal, Schott 454a, May 7, 1865, *977599;* Schott 456, May 8, 1865, *977602;* Schott 447, May 12, 1865, *980502*.

GRACILARIA COMPRESSA (C. Ag.) Grev.—GULF OF MEXICO: Schott 181, 1853, *978981;* COLOMBIA: Cartagena, Schott 1, 4, 39, Nov. 1857, *968556, 977625, 977622;* Schott 5, Nov. 8, 1857, *980653;* Schott 49, Nov. 1858 (date?), *977637*.

GRACILARIA CONFERVOIDES (L.) Grev.—TEXAS: Schott, no number, Indianola, 1853, *977643;* Schott, no numbers, Jan. 1853, *977618, 980745;* Schott, no numbers, Feb. 1, 1853, *42610, 977624;* Schott, no number, Feb. 7, 1853, *980540;* Galveston, Schott, no number, Feb. 6, 1853, *979281;* GULF OF MEXICO: Schott 187 in part, 1853, *978975;* YUCATAN: Sisal, Schott 446, May 9, 1865, *979975*.

GRACILARIA CONFERVOIDES var. LONGISSIMA Harv.—COLOMBIA: Cartagena, Schott 21, Nov. 1857, *968558* (Harvey and Schott 1861, p. 177 as *G. confervoides*).

GRACILARIA CORNEA J. Ag.—COLOMBIA: Cartagena, Schott 2, 17, 17b, 17c, (these four by Harvey and Schott 1861, p. 177 as *G. caudata*), 84, 84a, Nov. 1857, *980736, 972768, 972766, 972765, 980525, 979681;* Schott 25, Nov. 8, 1857, *980500* (Harvey and Schott 1861, p. 177, as *G. duraé*); Schott 42, Nov. 1858 (?), *980503* (Harvey and Schott, *do.*)

GRACILARIA DAMAECORNIS J. Ag.—COLOMBIA: Cartagena, Schott 33, 34 in part, 39, 48, 49 (these last three, and others, Harvey and Schott 1861, p. 177 as *G. rangiferina*), 88, Nov. 1857, *980595, 980735, 977622, 980616, 977637, 980729*.

GRACILARIA DOMINGENSIS Sond.—YUCATAN: Celestum, Schott 447 in part, May 13 1865, *979682*. This name is used in the sense in which it was used by Collins, Phyc. Bor.-Amer. 790, which is not necessarily nomenclatorially correct.

GRACILARIA FEROX J. Ag.—COLOMBIA: Cartagena, Schott 15 (Harvey and Schott 1861, p. 177 as *G. domingensis*), 16 (Harvey and Schott *do.* as *Alsidium Schottii*), 38 (Harvey and Schott *do.* as *G. cervicornis*), Nov. 1857, *977601, 980542, 977600;* CUBA: Habana, Schott 212, Nov. 7, 1864, *980527;* YUCATAN: Sisal, Schott 456a, May 7, 1865, *980596.*

GRACILARIA FOLIIFERA (Forssk.) Børg.—COLOMBIA: Cartagena, Schott 12, 18 (Harvey and Schott 1861, p. 177, as *G. multipartita*), Nov. 1857, *977623, 977636;* Schott 86, Nov. 8, 1857, *977639* (Harvey and Schott *do.*); CUBA: Habana, Schott 236, Nov. 1864, *977603;* Schott 218, Nov. 5, 1864, *977638;* Schott 220, Nov. 6, 1864, *977630;* YUCATAN: Sisal, Schott 445, May 9, 1865, *977629* (?).

GRACILARIA MAMILLARIS (Mont.) Howe.—COLOMBIA: Cartagena, Schott 9, 9a, 9b (Harvey and Schott 1861, p. 177 as *Rhodymenia Palmetta*), 91a, Nov. 1857, *980749, 980544, 979001, 980516, 982222.*

Champiaceae

CHYLOCLADIA OVALIS (Huds.) Hook.—COLOMBIA: Cartagena, Schott 53, Nov. 1857, *980747.*

The single specimen preserved showed the characteristic fibrous basal portion and a half dozen coarse erect branches which reached 12 cm. in height. The branches were naked below, but above the vesicular branchlets were well developed, though not crowded. They became distinctively plurilocular, with 5–7 cask-shaped segments in the longest ones. The maximum length ranged to 12–17 mm.; the width was 2 mm. in the dried specimen. This plant had been reported from Brazil by Martens (Taylor 1931, p. 304) as *Gastroclonium ovale;* this appears to be the second American record.

Ceramiaceae

CERAMIUM FASTIGIATUM Harv.—YUCATAN: Progreso, Schott 346, Apr. 5, 1865, *980530;* Schott 346e, May 9, 1865, *979507.*

CERAMIUM NITENS (C. Ag.) J. Ag.—COLOMBIA: Cartagena, on shells, Schott 451, no date, *982229.*

CERAMIUM STRICTUM (Kütz.) Grev. & Harv.—TEXAS: Indianola, Schott 35, and without number, Jan. 1853, *982230, 982268;* Schott 34, Feb. 1, 1853, *982252.*

CENTROCERAS CLAVULATUM (C. Ag.) Mont.—TEXAS: Indianola, Schott 25, no date, *980816;* Schott, no number, in minor part, Feb. 1, 1854, *977640;* COLOMBIA: Cartagena, Schott 41, Nov. 1857, *982232;*

CUBA: Habana, Schott 948 in minor part, Nov. 6, 1864, *980537;* YUCATAN: Sisal, Schott 454 in minor part, May 7, 1864, *977634;* Schott 423, in minor part, May 8, 1865, *977616;* Schott 277, 277a, 346e, all in minor part, May 9, 1865, *979684, 980520, 979507;* Progreso, Schott 346d, Apr. 5, 1865, *979506;* Celestum, Schott 378a and without number, both in minor part, May 13, 1865, *982241, 980732;* COLOMBIA: Puerto Colombia, Fr. Elias 1525, in minor part, Jan, 1837, *881174;* PANAMA CANAL ZONE: Cristobal, Mrs. Geo. Artamanoff, no number, Feb. 8, 1939, *968564.*

SPYRIDIA ACULEATA var. HYPNEOIDES J. Ag.—YUCATAN: Progreso, Schott 346a, 788, 277b, 373, all in minor part, Apr. 5, 1865, *980720, 980647, 980520, 40257;* Sisal, Schott 420, 348f in minor part, May 8, 1865, *982228, 977641;* Schott 346e, in minor part, May 9, 1865, *979507;* Celestum, Schott without number, May 13, 1865, *980732.*

SPYRIDIA FILAMENTOSA (Wulf.) Harv.—COLOMBIA: Cartagena, Schott 45, Nov. 8, 1857, *982226;* YUCATAN: Sisal, Schott 787, May 8, 1865, *982225,* Schott 370 in minor part, May 9, 1865, *980724.*

Dasyaceae

DASYA PEDICELLATA (C. Ag.) C. Ag.—TEXAS: Indianola, Schott 6, Jan. 1853, *980719.*

Rhodomelaceae

ACANTHOPHORA MUSCOIDES (L.) Bory.—COLOMBIA: Puerto Colombia, Fr. Elias 1525, Jan. 1937, *881174.*

ACANTHOPHORA SPICIFERA (Vahl) Børg.—COLOMBIA: Cartagena, beach toward Boca Grande, Schott 35, Nov. 1857, *977619* (Harvey and Schott 1861, p. 177, as *A. antillarum);* YUCATAN: Sisal, Schott 423, May 8, 1865, *977616.*

BRYOTHAMNION SEAFORTHII (Turn.) Kütz.—COLOMBIA: Cartagena, Schott 3 (Harvey and Schott 1861, p. 177, as *Alsidium Seaforthii*), 91 in minor part, Nov. 1857, *982221, 982234;* YUCATAN: Sisal, Schott 423, May 8, 1865, *977616;* Schott 418, May 9, 1865, *982243;* Progreso, Schott 422, Apr. 5, 1865, *1013303;* CUBA: Habana, Schott without number, Nov. 5, 1864, *982223.*

BRYOTHAMNION TRIQUETRUM (Gmel.) Howe.—COLOMBIA: Cartagena, Schott 92 (Harvey and Schott 1861, p. 177, as *Alsidium triangulare*), 44 in minor part, Nov. 1857, *982298, 980742;* Schott 37, Nov. 8, 1857, *1013302* (Harvey and Schott, *do.*); YUCATAN: Progreso, Schott 278, Apr. 5, 1865, *977620;* G. F. Gaumer 2369, without date, *979002;* Celestum, Schott 421, May 13, 1865, *982233;* José Fout

(in Schott herbarium without number), no date, *980512;* Chichankanab, G. F. Gaumer 1348, no date, *980539;* CUBA: Habana, Schott 229 and without number, Nov. 5, 1864, *982249, 982223.*

CHONDRIA ATROPURPUREA Harv.—COLOMBIA: Cartagena, Schott no number or date, *982246;* YUCATAN: Sisal, Schott 419, May 9, 1865, *1013301.*

DIGENIA SIMPLEX (Wulf.) C. Ag.—TEXAS: Indianola, Schott without number, Feb. 1, 1853, *1013286;* YUCATAN: Celestum, Schott 378, 378a, May 13, 1865, *1013287, 982241.*

DIPTEROSIPHONIA DENDRITICA (C. Ag.) Falkenb.—COLOMBIA: Cartagena, Schott 19, 91, 91a, and without number, in minor part, upon *Protokuetzingia Schottii, Corallina subulata,* etc., Nov. 1857, *980817, 982234, 982222, 1013299.*

HERPOSIPHONIA TENELLA (C. Ag.) Ambronn.—COLOMBIA: Cartagena, Schott 19, and without number, on *Protokuetzingia,* Nov. 1857, *980817, 1013299,* both in minor part.

LAURENCIA CORALLOPSIS (Mont.) Howe.—CUBA: Habana, Schott 234, Nov. 1864, *1013288.*

LAURENCIA GEMMIFERA Harv.—COLOMBIA: Cartagena, Schott without number or date, *1013294* (Harvey and Schott 1861, p. 177 as *L. paniculata* in part).

LAURENCIA OBTUSA (Huds.) Lamx.—YUCATAN: Progreso, Schott 230, 348, 348a, Apr. 5, 1865, *1013290, 1013291, 1013289;* Sisal, Schott 348f, May 8, 1865, *977641.*

LAURENCIA POITEI (Lamx.) Howe.—COLOMBIA: Cartagena, Schott 31, Nov. 1857, *980723* (Harvey and Schott 1861, p. 177 as *L. paniculata* in part); Schott 43, Nov. 1858, *980718* (Harvey and Schott, *do.*); CUBA: Habana, Schott 230 Nov. 5, 1864, *1013293.*

LAURENCIA PAPILLOSA (Forssk.) Grev.—COLOMBIA: Cartagena, Schott 50, Nov. 1858, *980722* (Harvey and Schott 1861, p. 177).

POLYSIPHONIA RAMENTACEA Harv.—COLOMBIA: Cartagena, Schott, no number or date, *1013297.*

Protokuetzingia Schottii, *sp. nov.* Planta fastigiata, stricta, axibus ramisque paullo alternato-divisis, ramulis oppositis et determinatis et ad apices incurvatis 2–3 in nodis praebentibus, trichoblastes deciduosas ferentibus, nodis 1–3 mm. inter se distantibus, cellulis pericentralibus 5, fastigiis omnibus corticatis. Spermatangia conico-ovoidea vel subcylindracea, curto-stipitata, in partibus posterioribus

ramulorum fertilum affixa. Plantae carpogoniales plus irregulariter fastigiatae, pericarpiis sessilibus et in partibus exterioribus ramulorum dense uniseriatis.—COLOMBIA: Cartagena, Schott 19, Nov. 1857, *980817* (TYPE in Cryptogamic Herbarium, Field Museum), *idem* without collection number, *1013299*. Plate II, fig. 4–8.

Plant bushy, nearly black when dry, to 18 cm. tall (or more?). Base a slightly lobed, moderately thick disk about 3–4 mm. diam. Axis somewhat flexuous, erect, about 1.7–2.0 mm. diam., sparingly alternately divided below, more closely divided above, the lesser branches essentially similar to the axes, which are hardly distinguishable in the upper third of the plant, the whole except near the base bearing paired determinate branchlets at intervals. Younger axes and branches about 0.5 mm. diam., straight or slightly curved at the tips, bearing immature branchlets which are generally alternate, seldom opposite, generally erect and strongly upwardly curved toward the acute tips. Determinate branchlets opposite, or solitary opposite an indeterminate branchlet, somewhat laterally placed with respect to the axial plane, simple or one or two times alternately branched, or with a few accessory branchlets arising at the base of that first formed. Determinate branchlets tapered, strongly curved, irregularly but generally upward, regularly placed at intervals of 1–3 mm., about 0.08–0.16 mm. diam., 1.0–1.15 mm. long, the apices with branched but deciduous trichoblasts. Spermatangial plants somewhat more symmetrically branched than the carpogonial, the branchlets longer, simpler and more erect. Spermatangia conic-oval to subcylindrical, 75–115 μ diam., 150–225 μ long, 3–5 (or more?) attached on short stalks on the back of a fertile determinate branchlet. Carpogonial plants somewhat more spreading and irregularly branched in the upper part of the plant. Fertile determinate branchlets commonly larger than those on sterile or spermatangial plants, often to 3 mm. long, to 0.16–0.24 mm. diam., strongly circinately curved upward, the pericarps crowded in a row on the outer side of the branchlet, sessile, rounded-conical to ovate, with the apex occasionally slightly pointed, generally (immature?) 45–80 μ tall and about as broad at the base, occasionally to 230–260 μ diam.

Harvey and Farlow in their annotations would have related these specimens to *Rytiphloea pinastroides*, or its var. *episcopalis*, now *Halopithys pinastroides* (DeToni 1903, p. 1081), not to *R. tinctoria*, the residual species in the genus, which is clearly defined. Regarding Montagne's *Rhodomela pinastroides* var. *episcopalis* (Montagne 1840, p. 153, pl. 8, fig. 3) one may note that he states

that it only differs from the species in characters of the fruiting plant. The pericarps are figured as stalked and mucronate, though they are dorsally aligned on the branchlets. His description states that they are sessile, but the figures contradict this. It has not been easy to decide on a generic assignment for the proposed species. It has nothing in common with the habit of *H. pinastroides*, so far as the writer's several reference specimens indicate. In *H. pinastroides* the ultimate main axes are percurrent and densely clothed with suberect branchlets. In the present species branching is coarser, open and loose, without dominant axes. In *H. pinastroides* the pericarps are short stalked on the upper sides of the branchlets bearing them; in the present they are seriate, sessile and crowded on the curved backs of the branchlets. The presence of five pericentral cells would seem to rule out *Protokuetzingia*, and absence of a winged margin to the axis clearly eliminates most of the related genera. The choice is reduced to *Halopithys* or *Protokuetzingia*, with an alteration in the description of either genus necessary to include this plant. So many features of *Halopithys* are discordant that the writer chooses to place it in *Protokuetzingia*. To be sure, that was described with six pericentral cells—two large lateral cells, two smaller dorsally and two smaller ventrally placed, the lateral branchlets aligned with the ventral borders of the lateral series of cells. In the proposed *Protokuetzingia Schottii* there are five pericentral cells. The single dorsal one is large, and the lateral ones very similar. The ventral pair are a little smaller; the opposite lateral branchlets are ventral to the lateral cell series as before. The result is an axis slightly compressed on one face: that toward which the branchlets appear to be formed. In *Halopithys* the pericentral cells are of equal size, with the branchlets alternately on each side of the ventral cell row, on successive axial segments. The pairs of branchlets arise from the same axial siphon in our material, as in *Protokuetzingia*, not from successive segments. The aspect of our plant is very similar to *P. australasica*. However, the axis is less distinct throughout the plant, the branching also not clearly distichous. The tendency for the main branches to be erect and alternate (paired with a branchlet), and only occasionally opposite, is the reverse of conditions in *P. australasica*, where the spreading branches are generally opposite. The trichoblasts are much less evident; that may only be a matter of skillful preservation.

VIDALIA OBTUSILOBA (Mert.) J. Ag.—COLOMBIA: Cartagena, Schott 1, Nov, 1857, *980816* (Harvey and Schott 1861, p. 177 as *Rytiphloea obtusiloba*).

BIBLIOGRAPHY

AGARDH, J. G.

1847. Nya Alger från Mexico. Oefvers. af Kongl. Vetensk.-Akad. Förhandl., 4(1):5–17.

1889. Species Sargassorum Australiae, descriptae et dispositae. Kongl. Svenska Vetensk.-Akad. Handl. 23(3): 1–133, 31 pl. with text.

BORGESEN, F.

1913–20. Marine Algae of the Danish West Indies, I. Dansk Bot. Arkiv, 1(4): 1–160. 1913. *Ibid.*, 2(2): 1–68. 1914. II, *Ibid.*, 3: 1–504. 1915–20.

DETONI, G. B.

1889–1924. Sylloge algarum omnium hucusque cognitarum. 1 (Sylloge Chlorophycearum): 1–12, I–CXXXIX, 1–1315. 1889. 3 (Sylloge Fucoidearum): I–XVI, 1–638. 1895. 4 (Sylloge Floridearum) (1): I–XX, I–LXI, 1–388. 1897; (2): 387–776. 1900; (3): 775–1525. 1903; (4): 1523–1973. 1905. 6 (Sylloge Floridearum) (5, Additimenta): I–XI, 1–767. 1924. Patavii.

EMORY, W. H.

Report on the United States and Mexican Boundary Survey. 1(1): i–lxvi, 1–174. Map. Washington.

ENGLER, A. and PRANTL, K.

1890–1897. Die Naturlichen Pflanzenfamilien. I, 2: i–xii, 1–580.

FALKENBERG, P.

Die Rhodomelaceen des Golfes von Neapel und der angrenzenden Meeresabschnitte. Fauna und Flora des Golfes von Neapel .... 26: i–xvi, 1–754, 23 pl. with text.

GEISER, S. W.

A Century of Scientific Exploration in Texas. Part 1: 1820–1880. Field and Laboratory 4: 41–55.

1937. Naturalists of the Frontier. 341 pp., illus. Dallas.

GRUNOW, A.

1915–1916. Additamenta ad cognitionem Sargassorum. K. K. Zool.—Bot. Gesell., Verhandl. 65: 329–448. 66: 1–48, 136–185.

HARVEY, W. H.

1852–58. Nereis Boreali-Americana. Smithsonian Contr. Knowledge. Part I, 1–150. 1852; Part II, 1–258. 1853 (designated also as vol. 5(5) of the *Contributions*); Part III, 1–140. 1858 (including Supplement).

1858–1863. Phycologia Australica. I: i–xi, Pl. I–LX with text, i–viii. 1858. II: i–iv, Pl. LXI–CXX with text, i–viii. 1859. III: i–iv, Pl. CXXI–CLXXX with text, i–viii. 1860. IV: i–iv, Pl. CLXXXI–CCXL, with text, i–viii. 1862. V: i–vi, Pl. CCXLI–CCC, with text, i–lxxiii. 1863.

HARVEY, W. H. and SCHOTT, A.

1861. Botany—Algae. *In:* Report of the Secretary of War Communicating Lieut. Micheler's Account of his Survey for an Interoceanic Ship Canal Near the Isthmus of Darien, IX Appendix B. Thirty-sixth Congress [U.S.A.] Second Session, Senate Ex. Doc. 9, pp. 175–178. Washington.

KÜTZING, F. T.

Tabulae Phycologicae. Vols. 1–20. Nordhausen.

MONTAGNE, J. F. C.

1840. Plantae cellulares DC., Familia III. Phyceae Fries. *In:* Barker-Webb, P. and S. Berthelot. Histoire Naturelle des Iles Canaries, Phytographia Canariensis, Sectio Ultima. 3(2): 132–208. Paris.

SARGENT, C. S.
1896. The Silva of North America. **10**: 18.

STANDLEY, P. C.
1930. Flora of Yucatan. Field Mus. Nat. Hist. Bot. Ser. **3**(3): 1–492.

TAYLOR, W. R.
1931. A Synopsis of the Marine Algae of Brazil. Revue Algol. **5**: 279–313.
1935. Marine Algae from the Yucatan Peninsula. Carnegie Inst. Washington Publ. **461**: 115–124.
1936. Notes on Algae from the Tropical Atlantic Ocean III. Papers Michigan Acad. Sci., Arts and Lett. **21**: 199–207. (1935).
1941. Note on the Marine Algae of Texas. Papers Michigan Acad. Sci., Arts and Lett. **26**: 69–79. (1940).

PLATES

PLATE I

Sargassum Hystrix var. *spinulosa* (Kütz.) Grun.

FIG. 1. Fertile branch with subtending leaves and receptacles. Grenada. ×4.0.

FIG. 2. Sterile branch tip showing the form of the leaves and distribution of the cryptostomata. Grenada. ×1.2.

FIG. 3. Fertile branch with subtending leaves and receptacles. Brazil. ×2.6.

1
2
3

PLATE II

Protokuetzingia Schottii, sp. nov.

FIG. 4. Upper portion of a sterile branch system. The upper part of the right-hand branch shows the development of an unusual number of indeterminate branchlets. ×3.0.

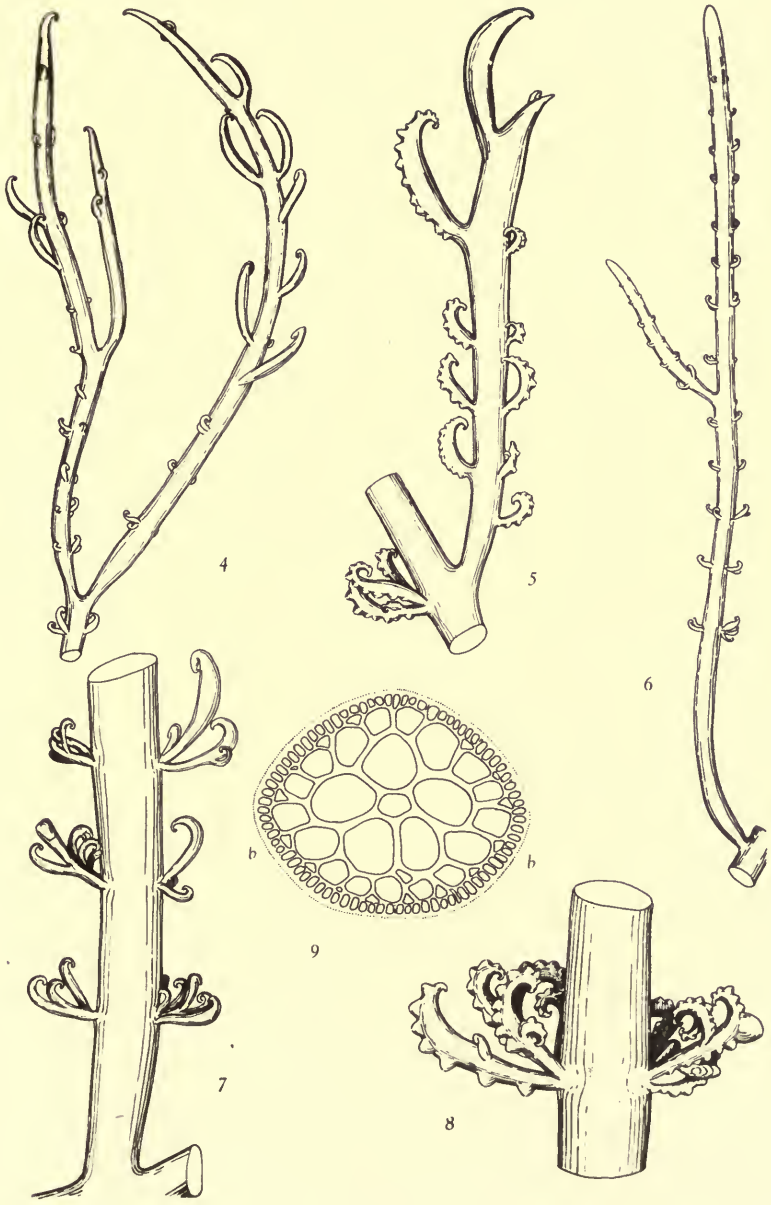
FIG. 5. Lateral branch upon a cystocarpic branch, showing the development of opposite, at first single, fertile branchlets. ×11.0.

FIG. 6. Upper portion of a typically straight sterile branch, showing one indeterminate branchlet and many pairs of groups of determinate branchlets. ×3.0.

FIG. 7. Lower portion of an old sterile branch, showing development at the nodes of additional determinate branchlets. ×11.0.

FIG. 8. Single node from an old cystocarpic plant, showing development of additional, and branched, fertile branchlets. ×15.0.

FIG. 9. Transverse section of a moderately old branch, showing pericentral cell arrangement. Branchlets arise in the positions marked "b". ×32.0.


4
5
6
7
b
b
9
8

THE LIBRARY OF THE
DEC 18 1941
UNIVERSITY OF ILLINOIS

UNIVERSITY OF ILLINOIS-URBANA
3 0112 018259165